

Objections to the Specification

In the Office Action Summary, the Examiner objected to the Specification. However, no discussion of the objection was provided in the Detailed Action. In the previous Office Action mailed May 8, 2001, the Specification was objected to for an informality. In a Response to that Office Action, the Specification was amended in a manner that addressed the concerns expressed in that Office Action. Therefore, Applicant assumes the current objection is erroneous, and thereby requests removal of the objection to the Specification, as it appears in the current Office Action Summary.

Section 103 Rejections

Claims 1-11 and 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,970,069 to Kumar et al. (hereinafter "Kumar") in view of U.S. Patent No. 5,991,817 to Rowett (hereinafter "Rowett"). To establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974); MPEP 2143.03. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); and, MPEP 2143.01. None of the cited art teaches or suggests all limitations of the currently pending claims, some distinctive limitations of which are set forth in more detail below.

None of the cited art teaches or suggests a plurality of functional units operably coupled in series, where each functional unit is configured to perform a specific function of a serial communication protocol. Claim 1 states, in part: "[a] serial communication controller...comprising: a plurality of functional units-operably coupled in series, wherein each functional unit is configured to perform a specific function of a serial communication protocol." Independent claim 14 recites a similar limitation.

Kumar discloses a single chip remote access process. (Kumar, Title). Kumar, however, does not teach or suggest a plurality of functional units operably coupled in series, where each functional unit is configured to perform a specific function of a serial communication protocol. Statements in the Office Action, however, suggest that "Kumar (5,970,069) discloses a serial communication controller (MultiChannel DMA controller 82 in fig. 3) for transmitting and receiving a serial data stream ...

comprising: a plurality of function units (controllers 72, 74, 76 in figure 3) operably coupled in series” (Office Action, page 4). As will be set forth in more detail below, such statements are hereby respectfully traversed.

For example, the Examiner states “Kumar teaches each [of the] functional units 76, 74, 72 [is] coupled in series with the serial controller 82 because, as well known in the art, at least two devices connected to each other ... is considered as coupled in series, thus the controller 82 is coupled in series with each [of the] functional units 72, 74, 76...” (Office Action pages 14 and 15). However, the limitation of “a plurality of functional units operably coupled in series,” as recited in claims 1 and 14, does not necessarily mean that the plurality of functional units are physically coupled in series with each other and/or with another component, as suggested by the Examiner. Instead, the phrase “operably coupled in series,” as supported in the Specification, e.g., on page 13, lines 4-15, indicates “the serial data stream [is passed] from one functional unit to the next in serial form during processing.”

For example, the meaning of the term “operably coupled in series,” as recited in claims 1 and 14, may be found in the Specification, for example, on page 13, lines 4-15. When the Specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant’s invention and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989); MPEP 2173.05(a). The Specification teaches:

[t]he function performed by each functional unit and the sequential ordering of the functional units are determined by the requirements of the serial data communication protocol (e.g., the HDLC protocol)...by partitioning the selected communication protocol into a number of functions to be performed in series, developing a functional unit to perform each of the identified functions, and operably coupling the functional units in series and in the proper order to produce a serial data stream according to the selected serial data communication protocol....In any case, the functional units are always operably coupled in series in order to produce a serial data stream according to the selected serial data communication protocol.

Conversely, Kumar does not teach or suggest a plurality of function units operatively coupled in series, as described in present claims 1 and 14 and defined in the Specification. For example, Kumar distinctly discloses six channels, each channel connected to a controller (e.g., 72, 74, and 76a-76d). Each of these controllers is coupled to an interface that supports a particular data communication protocol. In one embodiment, Kumar discloses “[m]ulti-protocol SWAN controllers 76a, 76b, 76c, and 76d support four multi-protocol WAN interfaces ... [for example] SWAN controller 76a can support a Frame Relay protocol.” (Kumar, column 5, lines 47-53). As such, data packets are transferred by a single controller (e.g., 72, 74, 76a, 76b, 76c, or 76d) according to a particular data communication protocol. (Kumar,

column 7, line 39). Therefore, controllers 72, 74, 76a, 76b, 76c, and 76d of Kumar each support a different data communication protocol by which to transfer the data packets independently from the other controllers. Consequently, Kumar does not teach or suggest all limitations of claims 1 and 14.

In addition, Kumar cannot be modified to teach or suggest interface controllers 72, 74, and 76 as being operably coupled in series, since doing so would render the invention of Kumar unsatisfactory for its intended purpose. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01.

For example, an intended purpose of the invention of Kumar is to provide a “remote access processor... [that] supports diverse remote access technologies” (Kumar, column 34, lines 57-60). In particular, Kumar describes such diverse remote access technologies as including “local area (LAN) network interface 36 ... and a plurality of serial wide area network (SWAN) interfaces 40, 42, and 44.” (Kumar, column 4, lines 36-40). To control data transfer using such diverse remote access technologies, Kumar discloses “V.34 CODEC interface 44 is coupled to V.34 interface controller 72... [e]thernet controller 74 is coupled to Ethernet [LAN] interface 36 ... [and] SWAN controllers 76a, 76b, 76c, and 76d ... [are coupled to] WAN interfaces”, such as WAN interfaces 40 and 42 (Kumar, column 5, lines 38-48). In this manner, Kumar explicitly discloses interface controllers 72, 74, and 76 as operably coupled in parallel to DMA controller 82 to achieve the intended purpose of supporting diverse remote access technologies (i.e., multiple data communication protocols). However, if the invention of Kumar were modified such that interface controllers 72, 74, and 76 were operably coupled in series with each other, such a modification would render the invention of Kumar unsatisfactory for its intended purpose. For example, if the invention of Kumar were modified such that the controllers (72, 74, and 76) were operably coupled in series, the invention of Kumar would only support one data communication protocol and not multiple data communication protocols. Therefore, Kumar provides no motivation to make such a modification. Accordingly, Kumar does not teach, suggest, or provide motivation for all limitations of present claims 1 and 14.

Rowett discloses an apparatus and method for a network router (Rowett, Title). Rowett, however, cannot be combined with Kumar to overcome the deficiencies therein. In particular, Rowett does not teach or suggest a plurality of functional units operably coupled in series, where each functional unit is configured to perform a specific function of a serial communication protocol. Rowett discloses a router that includes serial channels where “[t]he channels each have an external interface connecting to

different LAN or WAN networks ... [in which] the serial channels are used for separately processing data packets.” (Rowett, Abstract. Emphasis added). Accordingly, Rowett discloses multiple serial communication controllers, SCCs, where each of the SCCs controls data transfer along a different serial channel. As illustrated in Fig. 11a for example, each of the multiple SCCs receives data packets from external data lines 93 and transfers the data packets to a corresponding serial channel (i.e., serial channel 0, serial channel 1, etc.). As such, Fig. 11a and supporting text of Rowett does not disclose that the data packets may be transferred from one SCC to the next in serial form. Therefore, the multiple SCCs are not operably coupled in series as recited in present claims 1 and 14. Consequently, Rowett does not teach or suggest all limitations of claims 1 and 14.

In addition, Rowett cannot be modified to teach or suggest SCCs 45 as operably connected in series, since doing so would render the modified invention of Rowett unsatisfactory for its intended purpose. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01.

In particular, the intended purpose of Rowett is to provide “a router architecture... that is adaptable to a wide variety of different network systems and peripheral interfaces...” (Rowett, column 1, lines 64-67). To satisfy such a purpose, the invention of Rowett includes “[m]ultiple serial communication controllers (SCCs) 45 ... [to] individually control each one of the serial channels.” (Rowett, column 4, lines 35-38. Emphasis added). In addition, the invention of Rowett includes “TSA 46 [which] can be programmed to disassemble and assemble TDM data streams having different formats loaded into different serial channels 45. Thus, the TSA 46 allows the router 12 to interface to different external network lines using different data protocols.” (Rowett, column 14, lines 45-50. Emphasis added). However, if the invention of Rowett were modified such that the plurality of SCCs 45 were operably coupled in series – instead of in parallel – only one data protocol would be supported by the plurality of SCCs 45 at one time. Thus, the modified router architecture of Rowett would not be adaptable to a variety of different network systems using different data protocols, and thus, would be unsatisfactory for its intended purpose. Consequently, Rowett provides no motivation to make such a modification. Accordingly, Rowett does not teach, suggest, or provide motivation for all limitations of present claims 1 and 14.

Since none of the cited art teaches, suggests, or provides motivation for a plurality of functional units operably coupled in series, the cited art cannot be combined or modified to teach or suggest the aforementioned limitation. As stated above, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); and, MPEP 2143.01. Therefore, claims 1 and 14 are nonobvious over Kumar and Rowett.

None of the cited art teaches or suggests a serial communication controller including a plurality of functional units that operates alternately upon portions of the multiple serial data channels of a received serial data stream. Independent claim 14 states in part: "... a serial communication controller coupled to receive ... the receive-serial data stream, wherein the serial communication controller comprises a plurality of functional units... and wherein the plurality of functional units operates alternately upon the portions of the multiple serial data channels of the receive serial data stream." Independent claims 1, 6 and 11 recite similar limitations.

As noted in the Specification, "[t]he functional units are operably coupled in series such that the functional units operate upon the serial data stream in sequence." (Specification, page 12, lines 16-18). In other words, each of the serially connected functional units operates in sequence (i.e., alternately) upon a serial data stream (i.e., a single time division multiplexed serial data stream comprised of alternating portions of the multiple serial data channels). In addition, the Specification clearly describes "operat[ing] alternately upon the portions of the multiple serial data channels" as passing "the serial data stream from one functional unit to the next in serial form during processing" (Specification, page 13, lines 1-2).

Kumar, on the other hand, does not teach or suggest a serial communication controller including a plurality of functional units, where each of the functional units operates alternately upon portions of the multiple serial data channels of a received serial data stream. In fact, the Office Action admittedly states, "Kumar does not explicitly disclose [sic] that the plurality of functional units operates alternately upon the portions of the multiple serial data channels of the receive serial data stream." (Office Action, page 12). Accordingly, Kumar does not teach or suggest all limitations of present claims 1, 6, 11 and 14.

Moreover, Kumar cannot be modified to teach or suggest a serial communication controller including a plurality of functional units that operates alternately upon portions of the multiple serial data channels of a received serial data stream, since such a modification would render the invention of Kumar

unsatisfactory for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01.

As stated above, the purpose of Kumar is to provide a remote access processor capable of supporting multiple data communication protocols. Each controller, as disclosed by Kumar, is directly coupled to an interface, which supports a different data communication protocol for the purpose of providing a plurality of “multiprotocol connectivity options.” However, if the invention of Kumar such that controllers 72, 74, 76a, 76b, 76c, and 76d each operate alternately upon portions of multiple serial data channels of a received serial data stream each controller would process the received serial data stream according to the same data communication protocol. As such, modification of the invention of Kumar in such a manner would not allow the remote access processor of Kumar to support multiple data communication protocols. Thus, Kumar provides no motivation to make such a modification. Kumar, therefore, does not teach, suggest, or provide motivation for all limitations of claims 1, 6, 11, and 14.

Furthermore, Rowett does not teach or suggest a serial communication controller including a plurality of functional units that operates alternately upon portions of the multiple serial data channels of a received serial data stream. Instead, Rowett specifically teaches, “TDM data stream 99 includes two B channel time slots and one D channel time slot... [t]he data packets carried in the first B-channel are received and transmitted through the time slot assigner 46, SCC 45 and the FIFO for serial channel 5, the data packets carried in the second B-channel are received and transmitted on serial channel 4 and the data packets carried on the D-channel are received and transmitted from serial channel 3.” (Rowett, column 9, lines 22-31. Emphasis added). As such, Rowett teaches that TSA 46 is coupled in parallel to a plurality of serial communication controllers (i.e., SCCs 45), such that each portion (i.e., first B-channel portion, second B-channel portion, and the D-channel portion) of a single TDM data stream 99 is directed through a different one of the plurality of SCCs 45 to DMA controller 42, as shown in Fig. 11a. Therefore, Rowett does not teach or suggest that TDM data stream 99 is passed from one SCC to the next in serial form during processing. Thus, Rowett does not teach or suggest a serial communication controller including plurality of functional units that operates alternately upon the portions of the multiple serial data channels of a received serial data stream. Accordingly, Rowett does not teach or suggest all limitations of independent claims 1, 6, 11, and 14.

Moreover, Rowett cannot be modified to teach or suggest a serial communication controller including a plurality of functional units that operates alternatively upon portions of the multiple serial data channels of a received serial data stream, since such a modification would render the invention of Rowett unsatisfactory for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP 2143.01.

As stated above, Rowett provides a router architecture adaptable to a variety of different network system and peripheral interfaces. The router includes multiple serial channels connected to multiple serial communication controllers, SCCs. The SCCs are operably coupled in parallel to provide the router with multi-protocol support. However, to modify the invention of Rowett such that the multiple SCCs “operate alternatively upon portions of the multiple serial data channels of a received serial data stream” would result in a router architecture capable of supporting only one protocol at a time. As noted above, however, such a modification would be contrary to the intended purpose of Rowett. Therefore, Rowett does not teach, suggest, or provide motivation for all limitations of claims 1, 6, 11, and 14.

Additionally, Rowett cannot be combined with Kumar to overcome the deficiencies therein. In particular, Rowett cannot be combined with Kumar in such a manner that teaches or suggests a plurality of functional units that operates alternately upon the portions of the multiple serial data channels of a received serial data stream. In regards to such a limitation, however, statements in the Office Action suggest “it would have been obvious to a skilled artisan to couple the TSA 46 as taught by Rowett to the controllers (72, 74, 76) in Kumar’s system” (Office Action, page 4). As will be described in more detail below, such statements are hereby respectfully traversed.

In general, the remote access processor of Kumar cannot be modified to include the time slot assigner (i.e., TSA 46) of Rowett, such that the combination of the cited art teaches or suggests the “plurality of functional units operates in time sequence upon the portions of the multiple serial data channels”, as taught in independent claims 1, 6, 11 and 14. As stated above, Rowett teaches that TSA 46 is coupled in parallel to a plurality of serial communication controllers (i.e., SCCs 45), such that each portion of TDM data stream 99 is directed through a different one of the plurality of SCCs 45 to DMA controller 42. Therefore, modifying the remote access processor of Kumar to include the time slot assigner (i.e., TSA 46) of Rowett would involve coupling TSA 46 in parallel to the plurality of interface controllers 72, 74, and 76 within the remote access processor of Kumar. As such, each portion of a single

TDM data stream would be directed to a different one of the plurality of interface controllers 72, 74, and 76. As stated above, however, each of the plurality of interface controllers 72, 74, and 76 provides a connection to a different network interface to receive and transmit a different data stream according to a different communication protocol. As such, directing portions of a single TDM data stream (having a single communication protocol) to a plurality of interface controllers (72, 74, and 76), each of which operate according to a different communication protocol, would render the remote access processor of Kumar inoperable. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 UAPQ 349 (CCPA 1959). MPEP 2143.01. Therefore, Rowett cannot be combined with Kumar to teach or suggest all limitations of independent claims 1, 6, 11 and 14.

For at least the reasons set forth above, none of the cited art, either individually or in combination, teaches, suggests, or provides motivation for all limitations of independent claims 1, 6, 11, and 14. Therefore, independent claims 1, 6, 11, and 14, and claims dependent therefrom, are patentably distinct over the cited art. Accordingly, Applicants respectfully requests removal of the § 103 rejections of claims 1-11 and 14-16.

Allowable Subject Matter

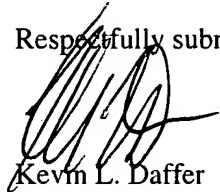
Claims 12-13 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and intervening claim. Applicants sincerely appreciate the Examiner's recognition of the patentable subject matter recited in claims 12-13. In addition to claims 12-13, Applicants believe the remaining pending claims are also allowable as set forth in more detail above.

CONCLUSION

This response constitutes a complete response to all issues raised in the final Office Action mailed October 25, 2002. In view of the remarks traversing the rejections, Applicant asserts that pending claims 1-16 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees, which may be required, or credit any overpayment, to Conley, Rose & Tayon, P.C. Deposit Account No. 50-1505/5000-74400.

Respectfully submitted,



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